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Fluctuations in Stock Prices of Companies in Indonesia as an Impact of Organizing Presidential Elections (Time Series Component Analysis: Cyclical Variation)

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Abstract

The objective of this study was to determine how non-economic events, such as the presidential election affect the Composite Stock Price Index. A descriptive quantitative method was used to collect secondary data from the Indonesia Stock Exchange (IDX) website. The data used is a historical data set from 1999 to 2019. The data was taken from the daily closing price of LQ45 on the JCI (Composite Stock Price Index). Analysis techniques using time series analysis. Data analysis used ARIMA (Autoregressive Integrated Moving Average) model. The study found that company stock prices changed due to presidential elections in 1999, 2004, 2009, and 2014. Suggestions for further research are to find techniques used as well as to include other elements that further influence investor decisions.

Keywords: *Stock Price; Investment; ARIMA*

Abstrak

Tujuan dari penelitian ini adalah untuk menentukan bagaimana peristiwa non-ekonomi, seperti pemilihan presiden mempengaruhi Indeks Harga Saham Gabungan. Metode kuantitatif deskriptif digunakan untuk mengumpulkan data sekunder dari situs web Bursa Efek Indonesia (BEI). Data yang digunakan adalah kumpulan data historis dari tahun 1999 hingga 2019. Data diambil dari harga penutupan harian LQ45 pada IHSG (Indeks Harga Saham Gabungan). Teknik analisis dengan menggunakan analisis time series. Analisis data yang digunakan menggunakan model ARIMA (Autoregressive Integrated Moving Average). Studi ini menemukan bahwa harga saham perusahaan berubah karena pemilihan presiden pada tahun 1999, 2004, 2009, dan 2014. Saran untuk penelitian lanjutan adalah untuk menemukan teknik yang digunakan serta memasukkan elemen lain yang lebih memengaruhi keputusan investor.

Kata kunci: Harga Saham; Investasi; ARIMA

Introduction

Political developments and economic stability are strongly correlated in every nation, including Indonesia. Political events in Indonesia occur regularly every 5 (five) years. Political events get the attention of investors to invest. If political events in a country political events are stable, it will affect the economy to be stable and investors will give a positive response. On the other hand, if the political event is unstable, it will threaten economic stability and get a negative response from investors (Sihotang & Mekel, 2015).

The goal of investing is to generate income in the future. In addition, investment can reduce inflationary pressures by avoiding the risk of a decline in the value of wealth due to the influence of inflation. (Tandelilin, 2017:8) Investment is also influenced by the non-economic environment, such as concern for the environment, human rights, and political events that can affect economic stability, thereby triggering stock price fluctuations on the stock exchange (Rahmawati, 2014).

Political events can make economic conditions fluctuate, especially in terms of stock prices. Stocks, which are one of the places to invest, can be used as a place to assess whether a company is worth investing in or not. Based on this, there are several things that contribute to the formulation of the problem in this study, namely as follows:

1. How do trends, seasonal variations, cyclical variations, and the unexpected affect the stock price movements of companies in Indonesia?
2. How does the presidential election affect stock price movements?

The purpose of this study was to determine the effect of trends, seasonal variations, cyclical variations, and the unexpected on stock price movements and to explain the effect of holding presidential elections on stock price movements.

This research has three main benefits: it can inform investors about companies that are suitable for investment, it can inform anyone who wishes to transact in the capital market, and it can provide scientific information about investment using time series component analysis (cyclical variation).

Research Method

This research employs descriptive quantitative methodologies, using secondary data obtained from the official website of the Indonesia Stock Exchange (IDX) and Yahoo Finance. The focus of the study is on analyzing the Composite Stock Price Index (CSPI). The population for this research consisted of 45 companies that were listed on the IDX and included in the LQ45 index from 1999 to 2019. The sample in this study were companies included in LQ45 in the political years 1999, 2004, 2009, 2014, and 2019. Data analysis techniques using time series components of cyclical variation. The data analysis method used is ARIMA (Autoregressive Integrated Moving Average).

Results and Discussion

Time Series in Stock Movements in Indonesia

This study uses time-series data analysis techniques (cyclical variation). The movement of the company's stock price in Indonesia is expressed in a graph according to the time series components, which are divided into the following sections:

1. Trend

Analysis Trends are seen on a long-term basis. This research was conducted in the period from 1999 to 2019 using 5092 active days on the stock exchange. The following is the result of data processed through graphs.

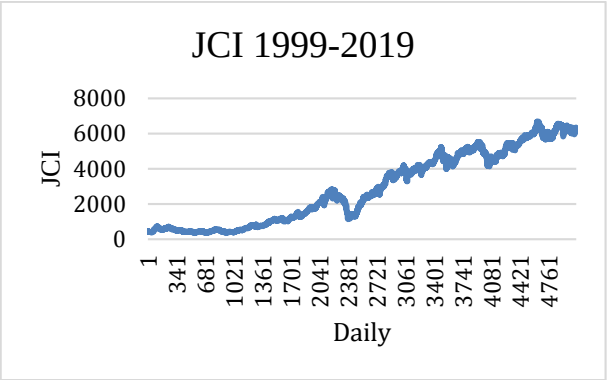

Figure 1. JCI 1999–2019

Figure 1 shows that the Jakarta Composite Index (JCI) had an upward movement in early 1999 and increased until the end of 2019. This shows a positive result, although it has fluctuated several times. As shown in Figure 1, there is a decline in the JCI.

2. Cyclic Variation

This cyclical variation shows a time series over a period of one year. This variation indicates fluctuations in stock prices over a period of several years. Researchers took data from the election year and the previous year. Stock price data is processed through the following graph:

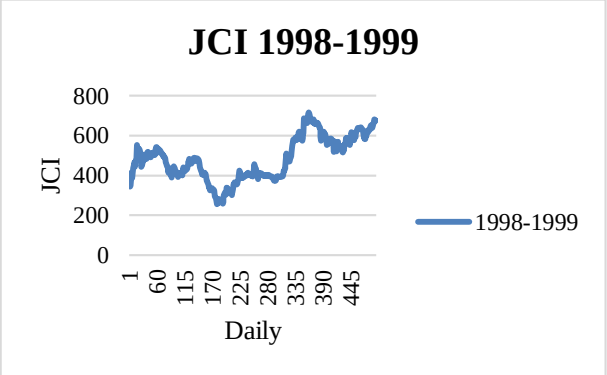

Figure 2. JCI 1998–1999

Figure 2 shows that 1998–1999 experienced very significant fluctuations in the JCI, which experienced ups and downs. In 1998, Indonesia experienced an economic crisis, so in mid-1999, the Indonesian economy experienced an increase.

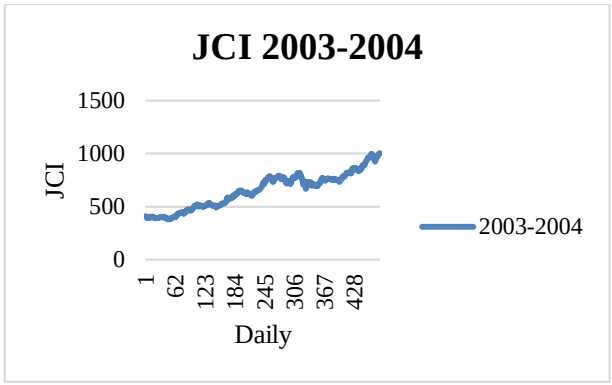

Figure 3. JCI 2003–2004

Figure 3 shows that in 2003–2004, there was an increase in a positive direction and tended to be more stable.

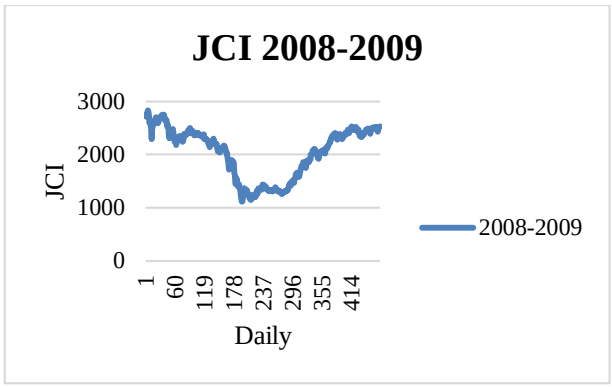

Figure 4. JCI 2008–2009

Figure 4 shows that 2008–2009 experienced fluctuations, especially at the end of 2008, and then increased in early 2009, where there was an election event in the middle of 2009.

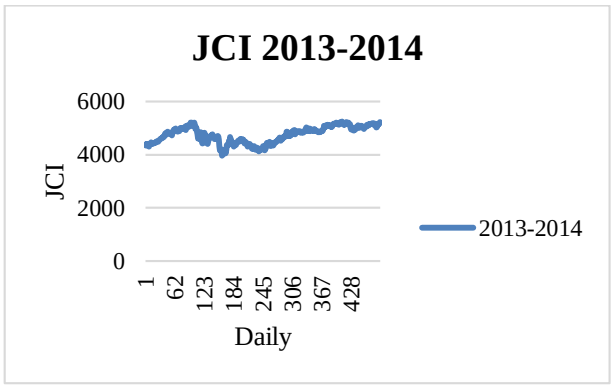

Figure 5. JCI 2013 – 2014

Figure 5 shows that in 2013–2014, the JCI tended to be more stable than in previous years. This shows that there is a price balance obtained by market participants through information entering the market.

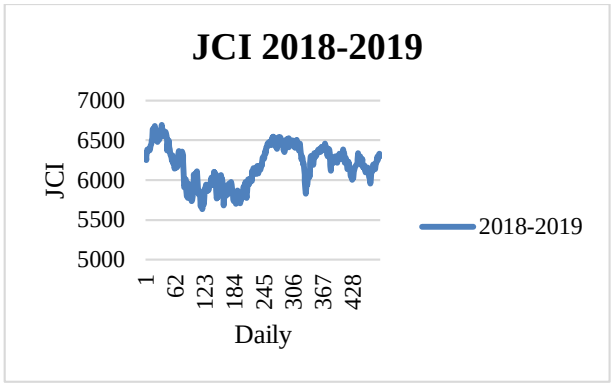

Figure 6. JCI 2018 – 2019

Figure 6 shows that in 2018–2019, the JCI experienced significant fluctuations, where in the middle of 2018, many decreased due to market conditions and increased in early 2019.

3. Season Variations

Seasonal variation is a pattern of changes in the time series over a year. This pattern is repeated every year. This seasonal variation was taken in the years of the presidential election, namely 1999, 2004, 2009, 2014, and 2019. The graph is based on the data obtained as follows:

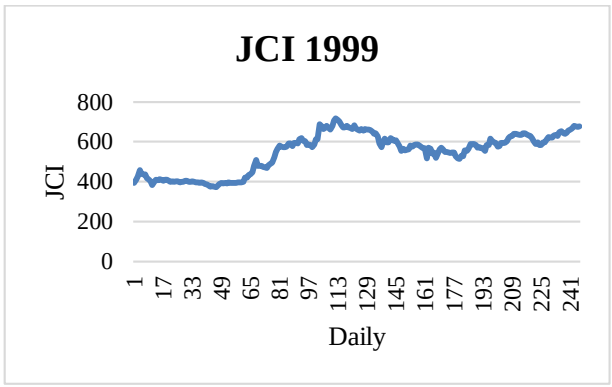

Figure 7. JCI 1999

Figure 7 shows that in 1999, the JCI in Indonesia is currently experiencing an economic recovery because, previously, in 1998, it experienced a monetary crisis. JCI rose to Rp. 716, but indeed, some have decreased to below Rp. 400. A non-economic event, namely the inaugural presidential election, was held this year on October 20, 1999. JCI on that day rose from the previous price of Rp. 584 to the price of Rp. 616.

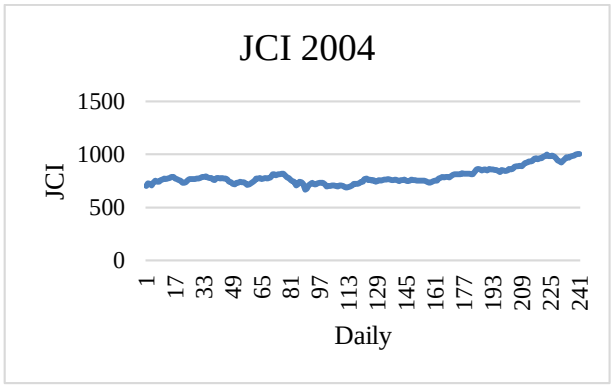

Figure 8. JCI 2004

Figure 8 shows that in 2004, the JCI tended to look more stable. This year, the election took place in two rounds, namely on July 5 and September 20, 2004. On that date, the JCI did not experience a significant increase and tended to be more stable.

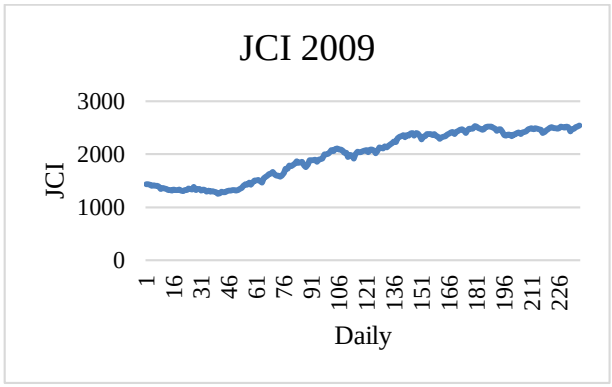

Figure 9. JCI 2009

Figure 9 shows the JCI in 2009 tended to be stable at the beginning and increased on June 24 to reach the price of Rp 2044 exactly 2 weeks before the Presidential Election on July 8, 2009. Furthermore, the stock price stabilized again above the price of Rp 2000.

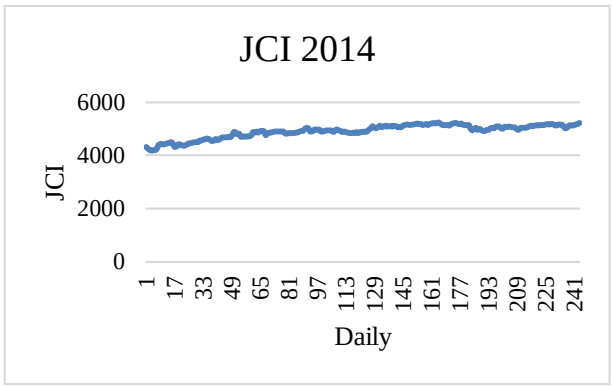

Figure 10. JCI 2014

Figure 10 shows the JCI in 2014, even though there was a general election in the middle of the year, namely on July 9, 2014. But this year, market participants did not catch the signal from market conditions, so the JCI tends to be stable.

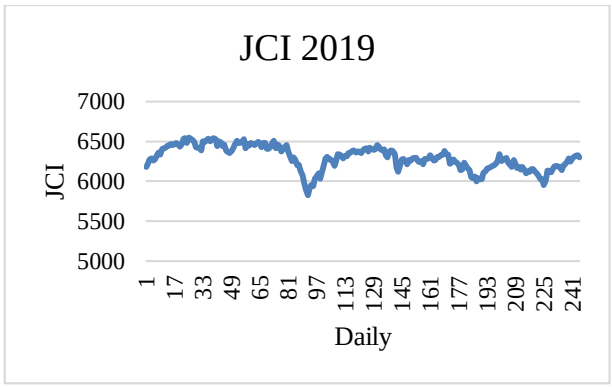

Figure 11. JCI 2019

Figure 11 shows that the JCI has fluctuated this year. In 2019, there was a presidential election on April 17, 2019, and after this election, the JCI fell to a price of Rp. 5826, which rose again after the announcement of the winner of the President and Vice President in May

2019. JCI slumped again in early August to the price of Rp. 6000 due to negative signals received by investors. The weakening of the JCI occurred again in early October, down to the price of Rp. 6000, which then declined again at the end of November to the same price of Rp. 5953. This was caused by some investors, who tended to be more wait-and-see and the trade war carried out by investors.

4. Irregular

Irregular variation is an irregular increase and decrease. Researchers see that this variation is seen in research in 2019, where unpredictable and coincidental fluctuations occur. In 2019, it can be seen from Figure 11, where in October it decreased due to the lack of good government financial reports, then strengthened again due to the formation of a new cabinet. November saw a coincidental decline due to a trade war among investors.

The Effect of the Presidential Election on Stock Movements in Indonesia

This study analyzes how non-economic events such as the presidential election affect stock price movements in Indonesia through the ARIMA (Autoregressive Integrated Moving Average) model using Minitab software. The implementation of the ARIMA model was carried out in the years of the general election, namely 1999, 2004, 2009, 2014, and 2019. The steps of the ARIMA model are as follows:

1. Model identification

At this stage the researcher identified the model by plotting the time series data. The data plot is presented as follows:

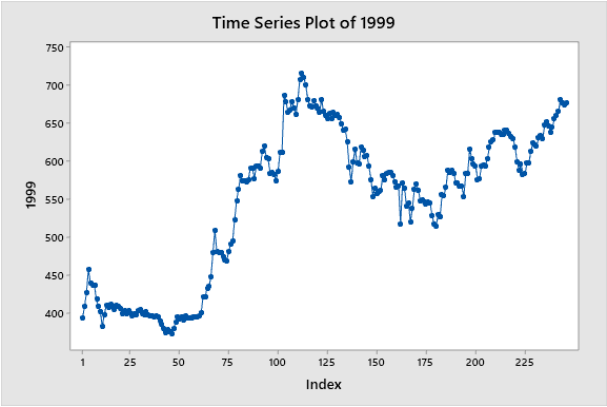

Figure 12. 1999 Data Plot

The data plot for 1999 shows that the data is uneven, so it is necessary to transform the data. The data for this year is carried out with three data transformations to get a rounded value of 1. The first transformation gets a rounded value of 0.50. The second transformation gets a rounded value of 0.52. After three transformations, you get a rounded value of 1.

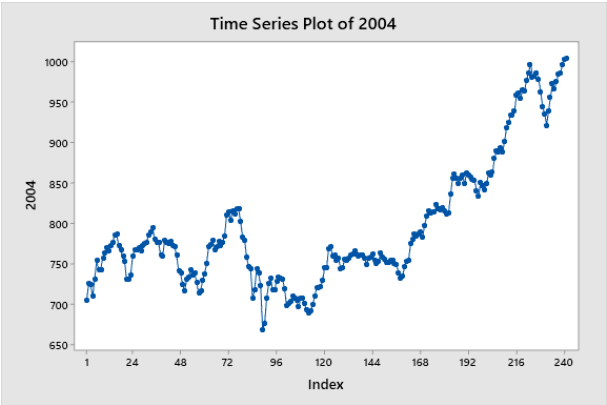

Figure 13. 2004 Data Plot

Although the data plot for 2004 shows fluctuations, this data does not transform and remains on the original JCI data because the rounded value obtained is directly worth 1.

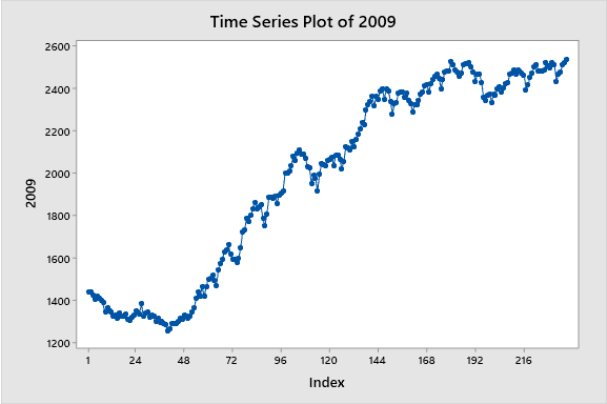

Figure 14. 2009 Data Plot

The data plot for 2009 shows trending data where the graph goes up, but the transformation is still being done here. The first result of this plot data is 0.5, so it does not meet the rounded value. Thus, a one-time transformation is performed for this data plot.

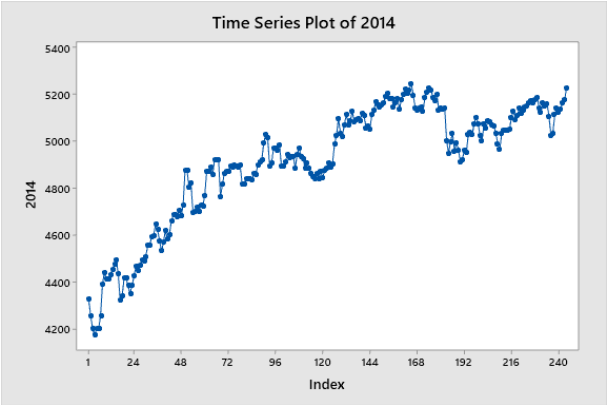

Figure 15. 2014 Data Plot

The data plot for 2014 shows insignificant data, so data transformation is necessary. The data for this year is only transformed once with the initial result of a rounded value of 3, and then the transformation is carried out with a rounded value of 1.

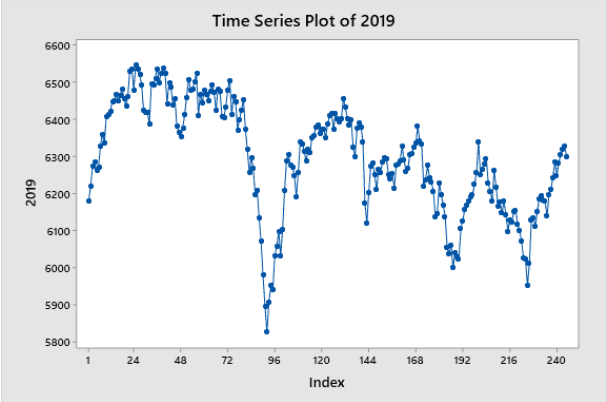

Figure 16. 2019 Data Plot

This 2019 data plot shows a highly fluctuating data plot. The best rounded value for this year is 5. So it cannot be used in this study because the rounded value must be 1.

2. Identification of ACF and PACF (Partial Auto Correlation Function/Partial Autocorrelation Coefficient)

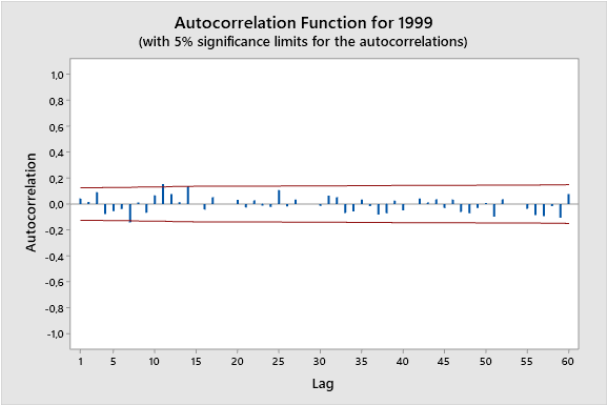

Figure 17. ACF 1999

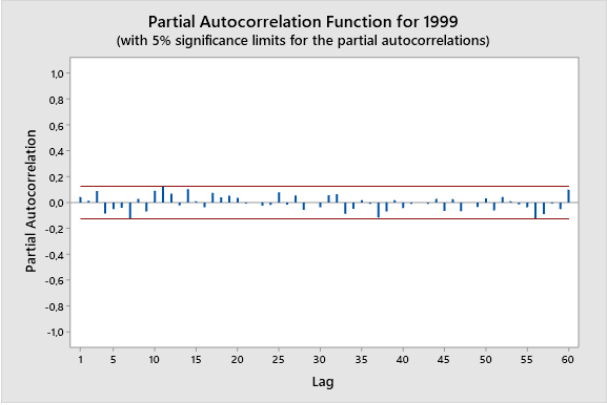

Figure 18. PACF 1999

Figures 17 and 18 are used to calculate and match the time series data, which is then used to determine the differencing level. This data is done with a total of 240 data points, so the ACF and PACF obtained are a quarter of the processed data, which is 60 data points. Figure 17 shows how to determine the maximum order of AR(p) by observing the time lag on the ACF. Meanwhile, to determine MA (q), it is seen through the time lag on the PACF. The

maximum order is seen by observing the time lag starting to decrease near 0. Judging from the picture above, the ACF and PACF of the alleged ARIMA model that fits are ARIMA (3, 1, 3).

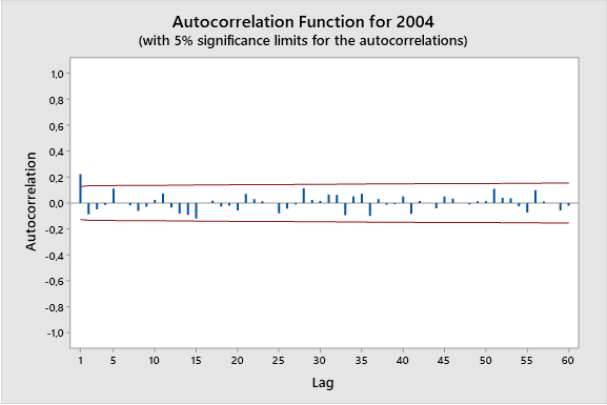

Figure 19. ACF 2004

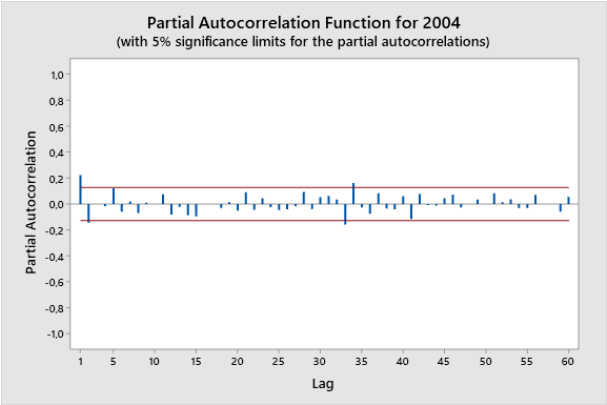

Figure 20. PACF 2004

Figures 19 and 20 show that the ACF and PACF obtained constitute a quarter of the processed data, which is 60 data points. Judging from the picture above, the ACF and PACF estimate that the appropriate ARIMA model is ARIMA (1,1,1).

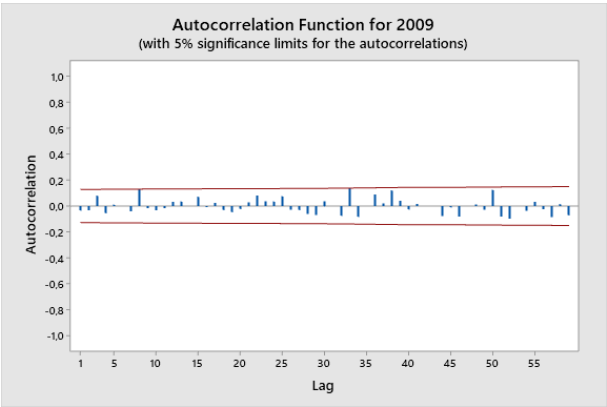

Figure 21. ACF 2009

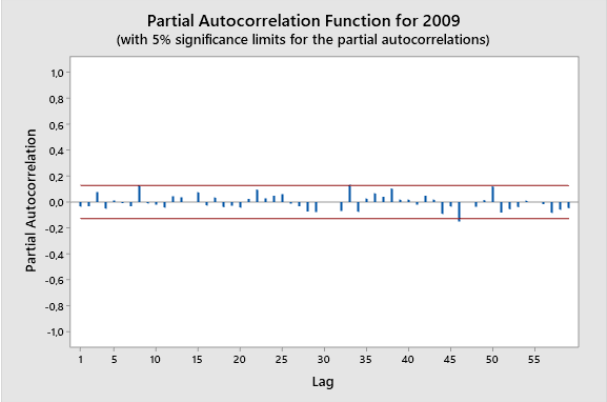

Figure 22. PACF 2009

Figures 21 and 22 show the ACF and PACF estimates of the ARIMA model that are suitable for ARIMA (3, 1, 3). This ACF and PACF plot shows the time lag period changing after the 3rd lag.

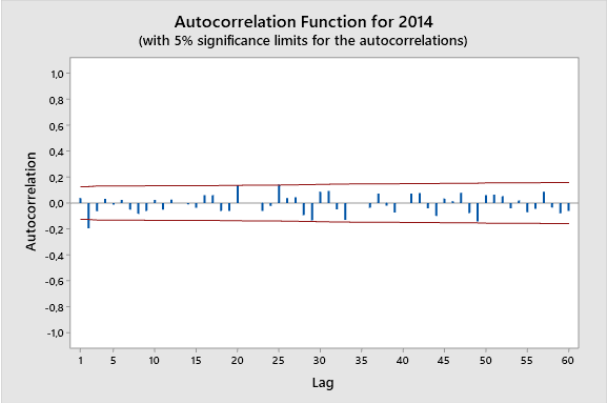

Figure 23. ACF 2014

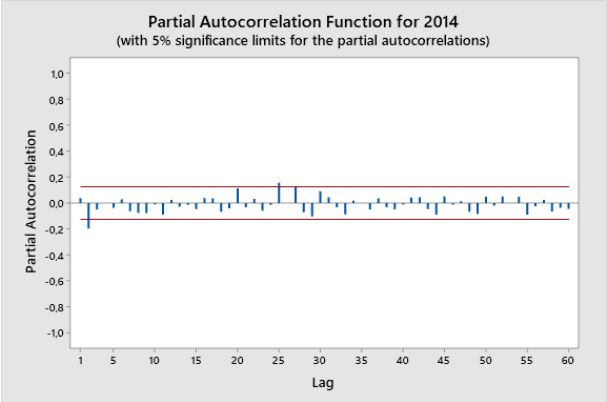

Figure 24. PACF 2014

Figure 24 data generated from this data plot is 60 data. This plot shows the results that match the ACF and PACF estimates of the ARIMA model (2, 2, 2) by doing the difference twice. ACF and PACF plots decrease in time lag period 2.

3. Selection of the best ARIMA models

The selection of the ARIMA model based on the analysis of the ACF and PACF plots shows that in 1999 and 2009, ARIMA was used (3, 1, 3), in 2004, ARIMA was used (1, 1, 1),

and in 2014, ARIMA was used (2, 2.2). The results of MA and RA are significant, as seen from the data below:

Table 1. ARIMA 1999

Type	Coef	SE Coef	T-Value	P-Value
AR 1	-0.522	0.169	-3.09	0.002
AR 2	-0.9003	0.0323	-27.88	0.000
AR 3	-0.531	0.132	-4.03	0.000
MA 1	-0.552	0.142	-3.89	0.000
MA 2	-0.93327	0.00686	-136.06	0.000
MA 3	-0.632	0.123	-5,13	0.000

Table 2. ARIMA 2004

Type	Coef	SE Coef	T-Value	P-Value
AR 1	-0.535	0.127	-4.21	0.000
MA 1	-0.7818	0.0935	-8.36	0.000

Table 3. ARIMA 2009

Type	Coef	SE Coef	T-Value	P-Value
AR 1	-0.5911	0.0233	-25.42	0.000
AR 2	0.6029	0.0223	26.99	0.000
AR 3	0.9812	0.0214	45,90	0.000
MA 1	-0.6228	0.0291	-21.43	0.000
MA 2	0.6241	0.0346	18.06	0.000
MA 3	0.9821	0.0105	93.88	0.000

Table 4. ARIMA 2014

Type	Coef	SE Coef	T-Value	P-Value
AR 1	-0.1373	0.0642	-2.14	0.033
AR 2	-0.1701	0.0650	-2.62	0.009
MA 1	0.77319	0.00320	241.99	0.000
MA 2	0.2160	0.0248	8.73	0.000

The selection of this ARIMA model based on the analysis of the ACF and PACF plots shows that the best ARIMA model used in this study is significant with a p-value <0.05. The best ARMa model used is adjusted to the time lag period to determine the maximum order for AR (p) and MA (q).

The results obtained through the analysis of non-economic events, namely the presidential election, in which the JCI was one of those affected by this incident, showed a significant influence on each political year. However, it does not apply for 2019 because the data obtained cannot be developed using ARIMA, so it is only carried out for plot analysis.

Every political year starts in 1999, 2004, 2009, and 2014. The government involves the people in making choices for a better government. One of these political actions affects the existence of new policies in the government, causing political risk. Political risk is inherent in a country and can affect its economic condition.

Political action has a big influence on the economic stability of a country. Information about a conducive political situation will increase stock prices. This is a signal that investors will receive to make investment decisions. Investors get positive signals and see well the actions that will be taken to make investments. This decision-making will affect the economic welfare and sustainability of the company and will affect the company's financial statements.

The company's financial statements affect the company's internal and external The external influence of the company shows good financial statements so that it can attract investors to invest. The internal influence for the company is to get capital to increase profits for the sake of the company's continuity in the future.

Conclusion

It can be concluded that time series data on the movement of company stock prices in Indonesia can be obtained through analysis of trends, seasonal variations, cyclical variations, and unpredictable variations. From the test results using ARIMA with a p-value <0.5, the signal obtained is a positive signal, so it has an influence on stock price fluctuations. The ARIMA test in 2019 cannot be developed, so it cannot be forecasted about stock prices in 2024. Further research is expected to be conducted to conduct experiments to determine whether the data to be used can be used properly and whether the method used is not only ARIMA and uses other factors that can be considered when making investment decisions.

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